



**Campus Based Modernization
eCampus Based Solution
70.1.12 - Test Analysis Report for Admin,
Batch, & Database Components**

**Version: 1.0
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1. Introduction

1.1. Document Objectives

The main objective of the eCampus Based (eCB) Release 2 Test Analysis Report (TAR) is to summarize the completed test effort and to document the requirements tested, the System Incident Reports (SIRs) noted, and any remaining open issues.

This TAR covers major product Release 2 of the eCB system, which includes design iterations 4 and 5 for the Admin, or back-end, functionality.

1.2. Test Approach

The test approach that was followed for eCB Release 2 was based on the concepts of the Software Development V-Model, phase containment, and entry/exit criteria.

The following diagram displays the Software Development V-Model methodology used by the eCB Modernization Partner team.

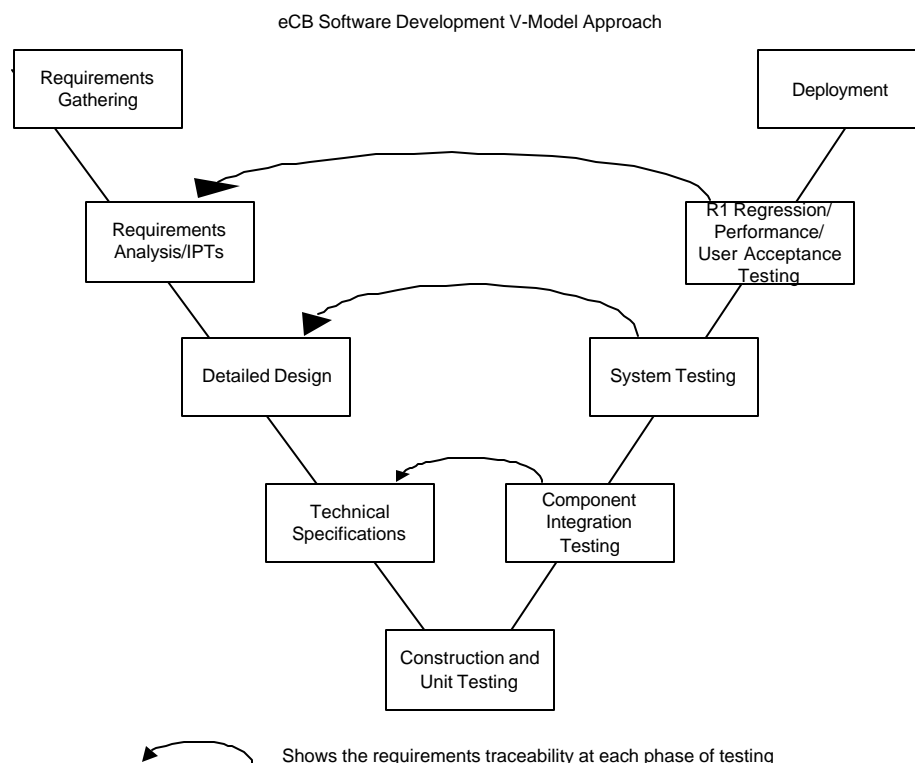


Figure 1 - eCB Software Development V-Model

The purpose of testing was to verify that the software met the business requirements of the Campus Based (CB) Program. The Test Team was tasked with this responsibility. The main responsibilities of the Test Team were to identify test conditions and expected results, create test



scripts, execute test scripts to verify the expected results, and to document a System Incident Report (SIR) when the actual results varied from the expected results. The Test Team used all available resources when preparing for and executing the test, including design deliverables, Development staff, and CB Staff Subject Matter Experts, to ensure the developed product met the outlined requirements.

1.3. Test Organization

1.3.1. Test Phases

The testing side, or right side, of the V-Model (reference Section 1.2 Test Approach) contains the test phases that the system must successfully complete before it may be deployed to production. The eCB Release 2 test effort contained five test phases: Component Integration, System, Release 1 Regression, Performance, and User Acceptance.

A test phase is a set of related test activities that share the same objective. For eCB Release 2, the Component Integration test phase focused on the system's detailed technical requirements on a module level. The System test phase focused on the interactions of the system's modules and tested the system as a whole. Additionally, Section 508 Testing was performed within the System test phase to ensure that persons with disabilities could perform the necessary processes of the eCB system.

The Release 1 Regression, Performance, and User Acceptance test phases each focused on the system's business processes and business-driven scenarios, but each contained a different scope. Release 1 Regression testing focused on the FISAP (Fiscal Operations Report & Application to Participate) on the Web, or front-end, side of the eCB system to ensure the Release 1 functionality currently in production was not adversely affected by the changes made for Release 2. Performance testing ensured that the eCB system could handle the stress created by the maximum load of 250 concurrent users. Finally, the purpose of User Acceptance testing was to verify that the system's modules could interact to handle the core business processes performed by the CB Staff.

1.3.2. Test Groups

A test phase may be broken into smaller, more manageable units, called groups. The Component Integration test phase contained four groups: Group 1, Group 2, Group 3, and Awards. Each group contained a subset of modules for the Release 2 product, and each group was tested independently throughout the Component Integration test phase.

Each group was tested by both the Test Team and the CB Staff. Following the Test Team's execution of each group, the CB Staff was given the opportunity to test the group's modules using scripts provided by the Test Team. The purpose of this effort was to provide the CB Staff with an opportunity to review the developed modules and provide feedback earlier in the test process. Component Integration User testing was performed for both Group 1 and Group 2, however user testing on Group 3 and Awards was postponed until the User Acceptance test phase.



1.3.3. Test Passes

A pass is defined as one full test execution cycle. Development remediation activities were conducted between passes within the same test phase or group. Additional passes were run within a test phase until the test was determined to be successful by the Test Change Control Board (CCB).



2. Test Schedule

All scheduled test phases and passes are complete for Release 2. The following table lists the major test execution passes for each test phase and the timeframe for each.

Component Integration Testing		
Group 1 Component Testing		
Pass	Start Date	Finish Date
1	December 4 th , 2001	December 5 th , 2002
2	December 10 th , 2001	December 11 th , 2001
3	December 14 th , 2001	December 14 th , 2001
4	December 19 th , 2001	December 19 th , 2001
Group 1 User Testing		
Pass	Start Date	Finish Date
1	December 12 th , 2001	December 13 th , 2001
2	December 17 th , 2001	December 17 th , 2001
3	December 20 th , 2001	December 20 th , 2001
Group 2 Component Testing		
Pass	Start Date	Finish Date
1	January 5 th , 2002	January 5 th , 2002
2	January 7 th , 2002	January 8 th , 2002
3	January 9 th , 2002	January 9 th , 2002
4	January 10 th , 2002	January 10 th , 2002
5	January 11 th , 2002	January 11 th , 2002
6	January 12 th , 2002	January 12 th , 2002
7	January 13 th , 2002	January 13 th , 2002
Group 2 User Testing		
Pass	Start Date	Finish Date
1	January 14 th , 2002	January 15 th , 2002
Group 3 Component Testing		
Pass	Start Date	Finish Date
1	February 5 th , 2002	February 6 th , 2002
2	February 13 th , 2002	February 15 th , 2002
3	February 18 th , 2002	February 18 th , 2002
4	February 21 st , 2002	February 21 st , 2002
Group 3 User Testing		
Pass	Start Date	Finish Date
User Testing was not performed for Component Integration Group 3 due to its proximity to User Acceptance Testing		
Awards Component Testing		
Pass	Start Date	Finish Date
1	January 2 nd , 2002	January 31 st , 2002
2	February 5 th , 2002	February 10 th , 2002
3	February 13 th , 2002	February 14 th , 2002



4	February 21 st , 2002	February 25 th , 2002
5	February 26 th , 2002	February 26 th , 2002
6	February 28 th , 2002	February 28 th , 2002
7	March 1 st , 2002	March 1 st , 2002
8	March 2 nd , 2002	March 2 nd , 2002
9	March 3 rd , 2002	March 7 th , 2002
10	March 9 th , 2002	March 11 th , 2002
Awards User Testing		
Pass	Start Date	Finish Date
User Testing was not performed for the Awards module within the Component Integration phase due to its proximity to User Acceptance Testing		
System Testing		
System Testing		
Pass	Start Date	Finish Date
1	February 23 rd , 2002	February 23 rd , 2002
2	February 27 th , 2002	February 28 th , 2002
3	March 2 nd , 2002	March 3 rd , 2002
Section 508 Testing		
Pass	Start Date	Finish Date
1	March 11 th , 2002	March 11 th , 2002
Release 1 Regression Testing		
Pass	Start Date	Finish Date
1	February 25 th , 2002	February 25 th , 2002
User Pass 1	March 18 th , 2002	March 19 th , 2002
Performance Testing		
Pass	Start Date	Finish Date
1	March 14 th , 2002	March 14 th , 2002
2	March 20 th , 2002	March 20 th , 2002
3	March 21 st , 2002	March 21 st , 2002
User Acceptance Testing		
Pass	Start Date	Finish Date
1	March 5 th , 2002	March 8 th , 2002
2	March 12 th , 2002	March 14 th , 2002
3	March 28 th , 2002	April 1 st , 2002

Table 1 – Test Schedule



3. Test Scope

3.1. Business Requirements Numbering Schema

The following table represents the requirement-tagging schema that will be utilized in Section 3.2 Business Processes and Requirements.

Req ID	Reference	ADM	DBS	RPT	WEB
ADM	Is an Administration Requirement	ADMAX - AUI	DBAAX -	ADM	WEBFX -
DBS	Is a Database Requirement	ADMCX -	Archive	RPTAA - AUI	FISAP
F	The requirement is derived from the FISAP submission process	CBWIN	DBAGX -	RPTAC -	WEBGX -
GEN	Is a General Requirement	ADMGX -	General	CBWIN	General
X	A placeholder because the reports area breaks down further	General	DBAIX -	RPTAU -	
RPT	Is a Reporting Requirement	ADMNX -	Interfaces	Utilities	
WEB	Is a web front-end requirement	Notes	DBASX -	WEB	
001	Indicates this is the first requirement of this sequence.	ADMUX -	Structure	RPTWF -	
		Utilities		FISAP	

Table 2 - Business Requirements Numbering Schema

3.2. Business Processes and Requirements

The scope of Release 2 testing consisted of the following high-level business functions (use cases) and their related requirements.

Design Iteration	Use Case ID	Use Case Description	Requirement ID(s)	Test Script
4	UC155	Admin Navigation	ADMAX001 ADMAX002 ADMCX051 ADMGX008 ADMGX011 ADMGX017 ADMGX018 ADMGX029 ADMGX030 ADMGX031 ADMGX034 ADMGX035 ADMGX036 DBAGX001 DBAGX004 DBAGX005 DBAGX006 DBAGX007	<u>Admin Login- Security- Navigation Script FINAL.xls</u>



Design Iteration	Use Case ID	Use Case Description	Requirement ID(s)	Test Script
			DBASX007 DBASX008 DBASX009 GEN001	
4	UC156	Accounting	ADMAX001 ADMAX002 ADMCX002 ADMCX028 ADMCX045 ADMCX048 ADMCX049 ADMCX050 ADMGX011 ADMGX014 ADMGX017 ADMGX023 ADMGX026 ADMGX027 DBAAX004 DBAAX010 DBAGX002 DBAGX003 DBAIX001 DBASX005 DBASX006	<u>FMS Files Script FINAL.xls</u> Note: Testing of the Accounting module was also conducted within the modules that interfaced with Accounting
4	UC157	Awards	ADMAX001 ADMGX015 ADMGX017 ADMGX023 ADMUX002 ADMUX003 ADMUX004 ADMUX005 DBAAX008 DBAAX009 DBAIX001	<u>Tentative Award Script FINAL.xls</u> <u>Final Award Script FINAL.xls</u> <u>Teacher Cancellation Award Script FINAL.xls</u> <u>Supplemental Award Script FINAL.xls</u>



Design Iteration	Use Case ID	Use Case Description	Requirement ID(s)	Test Script
4	UC158	Recalculation	ADMCX043 ADMCX044 ADMCX045 ADMCX046 ADMCX047	<u>Recalculation Script FINAL.xls</u>
4	UC159	FISAP View/Update	ADMAX001 ADMAX002 ADMAX003 ADMAX004 ADMAX005 ADMCX001 ADMCX004 ADMCX009 ADMCX011 ADMCX012 ADMCX013 ADMCX014 ADMCX015 ADMCX016 ADMCX017 ADMGX022 DBAAX003 DBAAX011	<u>Update View FISAP Script FINAL.xls</u>
4	UC160	New School	ADMAX002 ADMGX018 ADMGX020 ADMGX022 DBASX004	<u>New School Script FINAL.xls</u>
4	UC161	Community Service Waivers	ADMCX021 ADMCX024 ADMCX025 ADMUX011	<u>Community Service Waivers Script FINAL.xls</u>
4	UC162	Title III Waivers	ADMCX019 ADMCX021 ADMCX022 ADMCX023 ADMUX012	<u>Title III Waivers Script FINAL.xls</u>
4	UC163	Underutilization Waivers	ADMCX020 ADMCX021 ADMCX027	<u>Under Use Script FINAL.xls</u>



Design Iteration	Use Case ID	Use Case Description	Requirement ID(s)	Test Script
4	UC164	PEPS Eligibility	ADMGX022 ADMUX005 ADMUX009 DBAIX002 DBAIX006	<u>Hold School Script FINAL.xls</u>
5	UC171	Reallocation	ADMAX002	<u>Reallocation Script FINAL.xls</u>
5	UC172	Close Out (Awards)	ADMUX002	<u>Closeout Script FINAL.xls</u>
5	UC173	Hold Schools	ADMCX003 ADMCX041 ADMCX042 ADMUX005 ADMUX009 DBAAX005 DBAIX002 DBAIX006	<u>Hold School Script FINAL.xls</u>
5	UC174	Change Authorization Amounts	ADMGX021	<u>Authorization Amounts Script FINAL.xls</u>
5	UC175	Admin Login/Security Table	ADMAX002 ADMGX032 ADMGX033	<u>Admin Login-Security- Navigation Script FINAL.xls</u>
5	UC176	Phone Log	ADMGX001 ADMGX002 ADMGX003 ADMGX004 ADMGX006 DBAAX001 DBAAX002	<u>ComLog Script FINAL.xls</u>
5	UC177	Manual Adjustment	ADMGX011	<u>WC_ManAdj Script FINAL.xls</u>
5	UC178	PART (IRS Skiptracing)	ADMGX019	<u>PART Script FINAL.xls</u>
5	UC179	PLIST	ADMCX031 ADMCX035 ADMCX036 ADMCX037 ADMCX038	<u>PLIST Script FINAL.xls</u>
5	UC180	Data Processing/E-mail	ADMCX008 ADMGX009	<u>SelfService_Email Script FINAL.xls</u>



Design Iteration	Use Case ID	Use Case Description	Requirement ID(s)	Test Script
5	UC181	Tracking	ADMAX003 ADMCX006 ADMCX007 ADMCX010 ADMCX011 ADMCX026 DBAAX006	<u>Tracking Script FINAL.xls</u>
5	UC182	School Main Menu	WEBGX001	<u>New School Script FINAL.xls</u>
5	UC183	Work-Colleges	ADMAX002	<u>WC_ManAdj Script FINAL.xls</u>



Design Iteration	Use Case ID	Use Case Description	Requirement ID(s)	Test Script
5	UC184	Reports	RPTAA001 RPTAA005 RPTAA006 RPTAA007 RPTAC004 RPTAC019 RPTAC022 RPTAC024 RPTAC028 RPTAU001 RPTAU002 RPTAU003 RPTAU005 RPTAU009 RPTAU013 RPTAU014 RPTAU018 RPTAU020 RPTAU024 RPTAU025 RPTAU027 RPTAU029 RPTAU030 RPTAU031 RPTAU032 RPTAU033 RPTAU034 RPTAU035 RPTAU039 RPTAU040 RPTAU041 RPTAU042 RPTAU044 RPTAU051 RPTCV001	<u>Reports Script</u> <u>FINAL.xls</u>

Table 3 – Business Processes and Requirements

In additional, the following script was used to test the Servicer Multi-Print functionality:
Multi_Servicer Print Script FINAL.xls



4. SIR Summary

4.1. SIR Tracking

Whenever a test condition did not return the expected result, the tester would log the discrepancy between the expected and actual result as a SIR. SIRs were logged and tracked in a web-enabled Rational ClearQuest database. The tester entered a long and short description of the issue (including the actual and expected results), assigned a severity and priority, and identified the test area (module), test phase, cycle (pass), and tester.

This figure displays the “Submit” page within the SIR database that the tester used to enter new SIRs. Similar pages were used to enter additional comments and modify the SIRs status. In addition, the tool contained a query and reporting feature to obtain the desired summary information.

The screenshot shows the 'Submit Defect' page for SIRdb00001149. The page has a yellow background and a title bar with 'Rational' and 'the e-development company'. The main form is titled 'Main' and contains the following fields:

- SIR #: SIRdb00001149
- Status: Open
- Headline: [Text Field]
- Severity: [Dropdown Menu]
- Priority: [Dropdown Menu]
- Type: [Text Field]
- Actions: [Text Field]
- Owner: [Text Field]
- Test Area: [Dropdown Menu]
- Tester: [Dropdown Menu]
- Test Phase: [Dropdown Menu]
- Cycle: [Dropdown Menu]
- Description: [Large Text Area]

Figure 2 – Sample SIR Submit Screen within the web-enabled tool

4.2. SIR Definitions

Each SIR was assigned a severity and a status based on the guidelines outlined in the tables below.



Severity Level	Label	Description
1	Critical	The anomaly results in the failure of the complete software system, a subsystem or a software module within the system.
2	Major	The anomaly results in a failure of the complete software system, a subsystem or a software module within the system. There is no way to make the failed component(s) work; however there is an acceptable processing alternative that will achieve the desired results (an acceptable work around exists, acceptable as defined by the client).
3	Average	The anomaly does not result in a failure, but causes the system to produce incorrect, incomplete, or inconsistent results, or the anomaly impairs system usability.
4	Minor	The anomaly does not cause a failure, does not impair usability, and the desired processing results are easily obtained by working around the anomaly.
5	Quality Exception	The anomaly is the result of non-conformance to a standard, is related to the aesthetics of the system, or is a request for an enhancement. Anomalies at this level may be deferred to a future release or even ignored where approved by the SFA Project Manager.

Table 4 – SIR Severity Levels

SIR Status	Definition
Opened	The SIR was created and is awaiting assignment or review
In-Progress	The SIR was assigned and that resource is currently working on its resolution
Resolved	Corrective action was completed and the SIR is awaiting validation /regression test
Closed	All corrective action has been completed and validated
Postponed	The Test CCB agreed to postpone the corrective action on this SIR until a later release
Duplicate	The issue identified in this SIR is identical to another open SIR, and the resolution to the duplicate SIR will be tracked through the other open SIR

Table 5 – SIR Statutes



4.3. Release 2 SIR Totals

The following table lists the total number of SIRs identified for each test phase within the Release 2 test effort. In addition, the table also shows the total number of SIRs within each severity level for each test phase.

Test Phase/Severity Level	1 - Critical	2 - Major	3 - Average	4 - Minor	5 - Quality Exception	Total Number of SIRs
Component Integration Group 1	1	1	46	8	1	57
Component User Group 1	1	1	9	3	12	26
Component Integration Group 2	6	13	18	22	4	63
Component User Group 2	0	0	2	0	6	8
Component Integration Group 3	6	24	52	34	6	122
Component User Group 3	0	0	0	0	0	0
Awards Component Integration	13	7	91	17	1	129
Awards Component User	0	0	0	0	0	0
System	0	18	27	17	2	64
Release 1 Regression	0	0	0	0	0	0
Performance	5	5	2	1	0	13
User Acceptance	5	12	101	71	55	244
Total eCB Release 2 SIRs	37	81	348	173	87	726

Table 6 - Total of Release 2 SIRs by Test Phase and Severity

A total of 726 SIRs were written during eCB Release 2 Component Integration, System, Release 1 Regression, Performance, and User Acceptance Testing. Further detail on the statistics from each test phase will be presented in Section 5 Test Statistics.



5. Test Statistics

This table displays the summary status of each test phase for Release 2. All testing has been completed.

Test Phase	Status
Component Integration	Complete
System	Complete
Release 1 Regression Testing	Complete
Performance Testing	Complete
User Acceptance Testing	Complete

Table 7 – Summary Status by Test Phase

The following sections will discuss the SIR statistics for each test phase. The following table will be used to represent the number and severity of the SIRs written during each pass for the specified test phase. This table also represents the status of the SIRs written during the pass. A *Status* of “Complete” equates to all SIRs within that pass having a SIR status of “Closed”, “Duplicate”, or “Postponed”. A *Status* of “Pending” means at least one SIR written during that pass is “Open”, “In-Progress” or “Resolved”.

Test Phase							
		Severity					Status
Pass	SIR Count	1	2	3	4	5	
Totals							
Summary: % SIR Resolution							

Table 8 – Example of the Test Phase Statistics table

5.1. Component Integration Test Analysis

During the Construction and Unit Test phase of eCB Release 2, each completed module became available for Component Integration testing independently of the other modules. Therefore the focus of the Component Integration test phase was to test each component in depth, independent of other modules, and to test the high-level interdependencies between modules when possible. As discussed in Section 1.3.2 Test Groups, the modules were organized and tested within groups to provide structure to the test efforts that occurred during this phase.

Once the Test Team completed Component Integration testing on a given group, the Testing Change Control Board met to review the results. If the CCB agreed that the exit criteria had been achieved, the group would be turned over to the CB Staff for Component User testing.

The following sections present the scope and test statistics for the groups within the Component Integration test phase.



5.1.1. Component Integration Group 1

Component Integration Group 1 testing consisted of the following modules:

- Admin Navigation
- Admin Login/Security Table
- CPS PIN/TIVWAN Interface
- Manual Adjustment
- Change Authorization Amounts
- Group 1 related Accounting processes
- Group 1 related FMS (Financial Management System) Interface processes

The following table contains the test statistics from Component Integration Group 1.

Component Integration Group 1							
		Severity					Status
Pass	SIR Count	1	2	3	4	5	
1	42	0	0	37	4	1	Complete
2	10	0	0	7	3	0	Complete
3	4	0	1	2	1	0	Complete
4	1	1	0	0	0	0	Complete
Totals	57	1	1	46	8	1	Complete
Summary: 100% SIR Resolution							

Table 9 – Component Integration Group 1 Test Statistics

5.1.2. Component User Group 1

Component User Group 1 tested the modules listed within Section 5.1.1 Component Integration Group 1. The following table contains the test statistics from Component User Group 1.

Component User Group 1							
		Severity					Status
Pass	SIR Count	1	2	3	4	5	
1	17	0	1	8	1	7	Complete
2	5	1	0	1	1	2	Complete
3	4	0	0	0	1	3	Complete
Totals	26	1	1	9	3	12	Complete
Summary: 100% SIR Resolution							

Table 10 – Component User Group 1 Test Statistics

5.1.3. Component Integration Group 2

Component Integration Group 2 testing consisted of the following modules:

- PEPS Eligibility



- PEPS Interface
- Hold Schools
- Tracking
- Close Out (Awards)
- Group 2 related Accounting processes
- Group 2 related FMS Interface processes

The following table contains the test statistics from Component Integration Group 2.

Component Integration Group 2							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	16	2	1	5	8	0	Complete
2	15	2	4	4	4	1	Complete
3	15	1	2	5	7	0	Complete
4	8	0	2	3	2	1	Complete
5	4	0	2	0	1	1	Complete
6	4	1	2	0	0	1	Complete
7	1	0	0	1	0	0	Complete
Totals	63	6	13	18	22	4	Complete
Summary: 100% SIR Resolution							

Table 11 – Component Integration Group 2 Test Statistics

5.1.4. Component User Group 2

Component User Group 2 tested the modules listed within Section 5.1.3 Component Integration Group 2. The following table contains the test statistics from Component User Group 2.

Component User Group 2							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	8	0	0	2	0	6	Complete
Totals	8	0	0	2	0	6	Complete
Summary: 100% SIR Resolution							

Table 12 – Component User Group 2 Test Statistics

5.1.5. Component Integration Group 3

Component Integration Group 3 testing consisted of the following modules:

- New School
- PART (IRS Skiptracing)
- Phone Log (Com Log)



- Community Service Waivers
- Title III Waivers
- Underutilization Waivers
- Data Processing/E-mail
- Reallocation
- FISAP View/Update
- PLIST
- Recalculation
- Work-Colleges
- School Main Menu
- Reports
- Group 3 related Accounting processes
- Group 3 related FMS Interface processes
- Update Self-Service
- Servicer Multi-Print

The following table contains the test statistics from Component Integration Group 3.

Component Integration Group 3							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	64	5	13	26	15	5	Complete
2	29	1	8	10	10	0	Complete
3	16	0	3	9	4	0	Complete
4	13	0	0	7	5	1	Complete
Totals	122	6	24	52	34	6	Complete
Summary: 100% SIR Resolution							

Table 13 – Component Integration Group 3 Test Statistics

5.1.6. Component User Group 3

Component User Group 3 testing was not performed due to its proximity to User Acceptance Testing and therefore no SIRs were identified. The Department of Education's Federal Student Aid (FSA) agency and the Modernization Partner agreed to bypass User testing on Component Integration Group 3 in order to begin System testing. The User community was given the opportunity to test these modules within the User Acceptance test phase.

5.1.7. Awards Component Integration

The Component Integration Awards test consisted of the following processes:



- Tentative Awards
- Final Awards
- Teacher Cancellation Awards
- Supplemental Awards
- Awards related Accounting processes
- Awards related FMS Interface processes
- Awards related Update Self-Service processes

The following table contains the test statistics from Awards Component Integration.

Awards Component Integration							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	37	3	1	26	7	0	Complete
2	15	1	1	12	1	0	Complete
3	4	1	1	2	0	0	Complete
4	29	4	1	20	4	0	Complete
5	1	0	0	0	1	0	Complete
6	2	0	1	0	0	1	Complete
7	9	1	0	7	1	0	Complete
8	6	3	0	3	0	0	Complete
9	11	0	0	10	1	0	Complete
10	15	0	2	11	2	0	Complete
Totals	129	13	7	91	17	1	Complete
Summary: 100% SIR Resolution							

Table 14 – Awards Component Integration Test Statistics

5.1.8. Awards Component User

Awards Component User testing was not performed due to its proximity to User Acceptance Testing and therefore no SIRs were identified. FSA and the Modernization Partner agreed to bypass User testing on the Awards module in order to begin System testing. The User community was given the opportunity to test this module within the User Acceptance test phase.

5.2. System Test Analysis

5.2.1. System

The focus of System testing was to verify that the system components and interfaces worked together as a whole by testing the high-level business processes within an integrated test environment.



The following table contains the test statistics from the System test phase.

System							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	53	0	13	23	15	2	Complete
2	5	0	2	3	0	0	Complete
3	6	0	3	1	2	0	Complete
Totals	64	0	18	27	17	2	Complete
Summary: 100% SIR Resolution							

Table 15 - System Test Statistics

5.2.2. Section 508

An accessibility review was conducted on the eCB system by the FSA Technology Center (within the Office of the Chief Information Officer). The purpose of the review was to ensure that persons with disabilities could perform the necessary processes of the eCB system.

This review was mandated by Section 508 of the Rehabilitation Act of 1998. Section 508 requires that electronic and information technology developed, procured, maintained, or used by Federal government agencies must be accessible to persons with disabilities. The system must allow a person with a disability to have comparable access to and use of information as a person without a disability.

The review was successful after one pass and did not produce a SIR. An exception was initially noted because the version of MicroStrategy currently used by FSA is not Section 508 compliant. However, the FSA Section 508 Coordinator clarified that FSA may continue to use the non-508 compliant version of MicroStrategy because it was purchased prior to the June 21st, 2000 cut-off date required by the regulation.

The following table contains the test statistics from Section 508 testing.

Section 508							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	0	0	0	0	0	0	Complete
Totals	0	0	0	0	0	0	Complete
Summary: No SIRs Identified							

Table 16 – Section 508 Test Statistics

5.3. Release 1 Regression Test Analysis

The Release 1 Regression phase consisted of a complete test of the “FISAP on the Web” to validate that the functionality within the first release remained intact after being integrated with the Release 2 product.



This test included all scripts that were executed by the Test Team for the Release 1 System Integration Test. The following links contain the scripts used:

[Release 1 Regression Test Script – Alabama A&M](#)
[Release 1 Regression Test Script – Bryan College](#)
[Release 1 Regression Test Script – California Culinary](#)
[Release 1 Regression Test Script – City University of New York](#)
[Release 1 Regression Test Script – Iowa Lakes](#)
[Release 1 Regression Test Script – Kennebec Web Upload](#)
[Release 1 Regression Test Script – Lincoln Script](#)
[Release 1 Regression Test Script – MedCenter](#)
[Release 1 Regression Test Script – Pac Travel Trade School](#)
[Release 1 Regression Test Script – UMASS](#)
[Release 1 Regression Test Script – West LA](#)
[Release 1 Regression Test Script – Dependency Scripts](#)
[Release 1 Regression Test Script – Field Entry Validation Scriptv2.1](#)

Two passes were conducted for this phase. The Test Team performed the first pass, while representatives of the CB Staff executed the second pass. Neither pass produced a SIR.

The following table contains the test statistics from the Release 1 Regression test phase.

Release 1 Regression							
		Severity					
Pass	SIR Count	1	2	3	4	5	Status
1	0	0	0	0	0	0	Complete
User 1	0	0	0	0	0	0	Complete
Totals	0	0	0	0	0	0	Complete
Summary: No SIRs Identified							

Table 17 – Release 1 Regression Test Statistics

5.4. Performance Test Analysis

The goal of Performance testing was to ensure that the system could handle the expected workload of 250 concurrent users performing normal business functions. Requirement ADMGX029 states, “The contractor shall propose an architecture that supports for access of up to 50 concurrent ‘ADMIN’ sign-ons. Estimated number of CB Staff and Other ED Users is 250.”

Performance testing was conducted with the assistance of the Modernization Partner’s Integrated Technical Architecture (ITA) group, as well as resources from the Virtual Data Center (VDC). The ITA Performance Test Environment at the VDC was used for this testing, and the LoadRunner performance test software was used to simulate the desired workload.

5.4.1. Test Setup

The performance test was setup to run for three hours per cycle, and would test a maximum of 259 concurrent users. Our performance goal for this test was 250 concurrent users. Those users were split into the following categories:



- FISAP on the Web/front-end functionality (maximum 209 concurrent users)
 - FISAP Navigation (200 users)
 - FISAP Data Update (9 users)
- Admin/back-end functionality (maximum 50 concurrent users)
 - Admin Navigation (44 users)
 - Admin Reports (6 users)
 - Tentative, Final, and Teacher Cancellation Awards (these processes were run manually to add additional stress to the environment)

The FISAP Navigation, FISAP Data Update, Admin Navigation, and Admin Reporting scripts were automated within the LoadRunner software to simulation the concurrent users, where the Awards scripts were run manually outside of the LoadRunner tool to insert additional performance stress into the environment. The following scripts were used for the Performance test:

[Performance Test Script - FISAP Navigation](#)

[Performance Test Script - FISAP Data Update](#)

[Performance Test Script - Admin Navigation](#)

[Performance Test Script - Admin Reports](#)

[Performance Test Script - Tentative Awards](#)

[Performance Test Script - Final Awards](#)

[Performance Test Script - Teacher Cancellation Awards](#)

The LoadRunner software was used to increase the number of concurrent users from zero to 250 over the first 12 minutes of the test, and then it introduced the nine FISAP Data Update users to the environment at a rate of one user every 20 seconds. The FISAP Data Update scripts ran to completion over a 20-minute period, while the remaining 250 virtual users were setup to run for the remainder of the three hours. Awards simulations and awards related accounting transactions were performed manually over the entire three-hour period.

5.4.2. Test Execution and Issue Resolution

Three main passes were executed. Staff from the VDC, ITA, and the Test Team executed the first two passes, while ITA and the Test Team performed the third pass.

During the test, four environmental issues were encountered that required resolution.

1. During the first pass, a segmentation violation error resulted in the failure of the test. The resolution was an update of the Shadow Direct software drivers within the Performance Test environment to version 03.06.0128. Since the completion of the Performance test, the version of Shadow Direct within the production environment was updated to version 03.06.0128.
2. An issue was identified with the web server maximum client setting. The resolution to this issue was to increase the setting to 1024. Since the completion of the Performance test, the web server maximum client setting was updated to 1100 within the production environment.



3. During the second pass, errors were encountered with session timeouts after running for 1 hour and 40 minutes (approximately 1 hour 30 minutes with the full load of 250 concurrent users). This error was caused by the TCP and kernel parameter settings on the web server. The resolution to this issue was to modify these settings in the Performance test environment and rerun the test. These updates not only resolved the timeout issue, but they significantly decreased the user response time. Since the completion of the Performance test, the kernel parameters and TCP parameters have been updated on the production web servers.
4. The second cycle of the second pass encountered an issue following approximately 2 hours and 35 minutes of successful operation. At that point, the WebSphere session database's Archiving tables ran out of available space. The extensive logging feature that was used during the test caused this issue. The resolution was to delete the unnecessary data from the Archiving tables and disable the extensive logging feature. Extensive logging will be disabled in the production environment; therefore no production remediation action is required.

A third pass was performed following the remediation of issue 4 and completed successfully. The test maintained at least 250 concurrent users (with a maximum of 259 users) for over 2 hours and 45 minutes following the initial build up. The total elapsed time of the test was 3 hours and 27 seconds, with an average Throughput of 625,200 bytes/second and an average of 332.913 Hits per Second. Finally, the test generated 118,793 passed transactions against 0 failed transactions and 0 errors for a 100% pass rate.

It is important to note that the issues identified during this phase were all related to the technical environment and architecture, and no performance errors were identified with the eCB system code.

5.4.3. Test Statistics

The following table contains the test statistics from the Performance test phase. In addition to the SIRs identified during the three load testing passes, all environmental issues (*i.e.* issues with the VDC environments or external interfaces such as CPS PIN) were logged in the SIR database under this test phase as well. These SIRs are classified under the "Environment" *Pass* in the table.



Performance							
		Severity					Status
Pass	SIR Count	1	2	3	4	5	
Environment	9	4	3	1	1	0	Complete
1	2	1	1	0	0	0	Complete
2	2	0	1	1	0	0	Complete
3	0	0	0	0	0	0	Complete
Totals	13	5	5	2	1	0	Complete
Summary: 100% SIR Resolution							

Table 18 – Performance Test Statistics

5.5. User Acceptance Test Analysis

The purpose of User Acceptance Testing (UAT) was for the user community to verify the usability of the new system and procedures, and to facilitate an understanding of the technology and the business change being implemented. Representatives from the CB Staff, FSA's electronic Commerce Application Development group, Indus (the eCB maintenance contractor), and the Internal Verification and Validation contractor participated in and conducted the user acceptance testing.

Three passes of UAT were conducted, and each contained both scripted and ad-hoc unscripted testing. The scripted UAT was facilitated by the Modernization Partner and consisted of the execution of scripts prepared by the Test Team to test the Campus Based business processes from a user perspective. The ad-hoc unscripted testing was facilitated by FSA and included the testing of business processes and system maintenance activities.

The following table contains the test statistics from the User Acceptance test phase.

User Acceptance							
		Severity					Status
Pass	SIR Count	1	2	3	4	5	
1	32	0	1	18	8	5	Complete
2	86	3	9	24	32	18	Complete
3	126	2	2	59	31	32	Complete
Totals	244	5	12	101	71	55	Complete
Summary: 100% SIR Resolution							

Table 19 – User Acceptance Test Statistics

At the completion of UAT Pass 3, FSA and the Modernization Partner reached an agreement on the SIRs to be fixed prior to transition to the maintenance contractor. This agreement and these 19 SIRs are discussed and identified in Section 7 Action Plan.



6. Test Environment

The following diagram depicts the environments used for the eCampus Based project, both at the Beacon (eCB Development contractor) facility in North Carolina and the VDC in Connecticut.

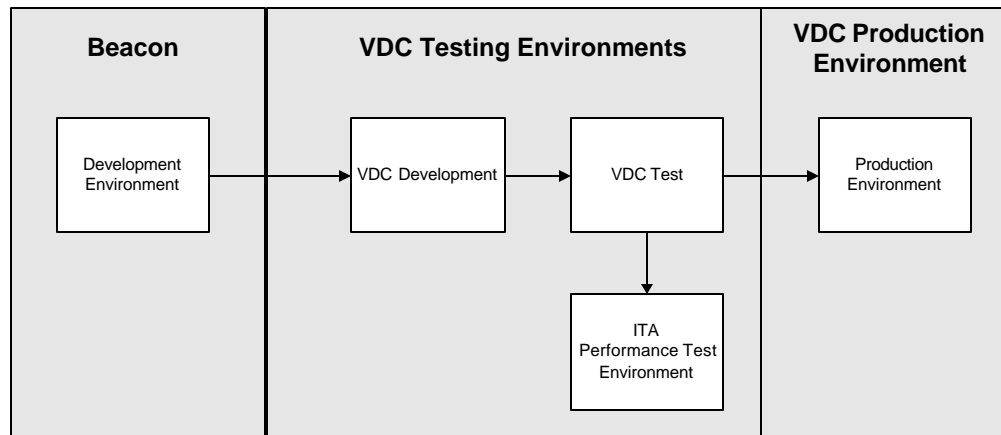


Figure 3 – Beacon and VDC Environments

Three separate environments were used to complete the Component Integration, System, Release 1 Regression, Performance, and User Acceptance tests. These environments were called VDC Development (or VDC Dev), VDC Test, and ITA Performance Test respectively. Each environment was architected to resemble the eCB production environment.

VDC Dev and VDC Test were the two environments used for Component Integration, System, Release 1 Regression, and User Acceptance testing, and each environment was a separate instance established on the same server configuration. The VDC Dev and VDC Test environments consisted of the following assets:

- 1 Sun E3500 Web Server (server name su35e2) using the Solaris Operating System and IBM HTTP Server software
- 1 Sun E3500 Application Server (server name su35e5) using the Solaris Operating System and IBM WebSphere software
- 1 Hewlett Packard 9000V Class Database Server (server name HPV1) with Oracle 8i database software
- 1 Compaq DL380 Server (server name SFANT001) with MicroStrategy reporting software

Performance testing was executed using the ITA Performance Test environment located at the VDC. This environment consisted of the following assets:

- 1 Sun E3500 Web Server (server name su35e6) using the Solaris Operating System and IBM HTTP Server software
- 1 Sun E3500 Application Server (server name su35e11) using the Solaris Operating System and IBM WebSphere software



- 1 Hewlett Packard 9000V Class Database Server (server name HPV1) with Oracle 8i database software
- 1 Compaq DL380 Server (server name SFANT001) with MicroStrategy reporting software
- 2 Microsoft NT servers (server names SN0031 and SN0032) with the LoadRunner performance test software



7. Action Plan

7.1. Final SIR System Test

At the conclusion of UAT Pass 3, FSA and the Modernization Partner leadership reached an agreement on the remaining action items to be completed by the Modernization Partner prior to transition of the software to the maintenance contractor. The conditions below were included in that agreement:

- The following SIRs were fixed by Beacon prior to transition of software to the maintenance contractor. Remediation of these SIRs was completed on April 30th, 2002.
 1. The following 2 Level 1 SIRs:
 - 1094, 1116
 2. The following 1 Level 2 SIR:
 - 1082
 3. The following 16 Level 3 SIRs:
 - 1038, 1039, 1040, 1041, 1043, 1052, 1053, 1054, 1055, 1056, 1064, 1070, 1073, 1074, 1079, 1093
- The Modernization Partner created scripts to system test the above 19 SIRs. The following links contain these scripts, which were reviewed with FSA and finalized on April 26th, 2002. The attached version includes their comments.
 - [FINAL SIR 1038 - WC_ATH_Hold Script v2.xls](#)
 - [FINAL SIR 1039 - Authorization Amounts Script v2.xls](#)
 - [FINAL SIR 1040 - New School SIR Script v2.xls](#)
 - [FINAL SIRs 1041_1043 - Teacher Cancellation Award Script v1.xls](#)
 - [FINAL SIRs 1052_1053_1054_1055_1056_1079_1093 - File Script v2.xls](#)
 - [FINAL SIR 1064 - PLIST Script v2.xls](#)
 - [FINAL SIRs 1070_1073_1074 - FISAP View_Update Script v2.xls](#)
 - [FINAL SIR 1082 - Reallocation Script v2.xls](#)
 - [FINAL SIRs 1094_1116 - Closeout Script v2.xls](#)
- The Modernization Partner conducted unit testing on the above 19 SIRs. Unit testing activities were completed on May 3rd, 2002.
- The Modernization Partner conducted scripted SIR system testing from May 6th through May 8th, 2002. Two test passes were conducted, one on May 6th and 7th, and the other on May 8th. 18 of the 19 SIRs passed their related scripts during the first pass, while the remaining SIR was closed during the second pass. Neither pass produced a new SIR. The following table contains the statistics from the Final SIR System test.



Final SIR System							
		Severity					Status
Pass	SIR Count	1	2	3	4	5	
1	0	0	0	0	0	0	Complete
2	0	0	0	0	0	0	Complete
Totals	0	0	0	0	0	0	Complete
Summary: No SIRs Identified							

Table 20 – Final SIR System Test Statistics

7.2. Transition Activities

Based on the agreement mentioned in Section 7.1 Final SIR System Test, all SIRs that were deferred for maintenance activity were marked as “Postponed” in the SIR database. In addition, all SIRs that were determined to be system enhancements during the normal change control process were labeled as “Postponed”.

The following link contains the complete listing of Release 2 SIRs that were “Postponed” for post-transition activity: [Postponed SIR Report](#)



8. Appendix A: SIR List by Test Phase

The following link contains the complete SIR listing for Release 2 sorted by Test Phase (alphabetically) and by Severity Level: [Release 2 SIR Report](#)



9. Appendix B: Release 1 Impacted Areas

Release 1 and Release 2 share areas of overlap where components are reused.

The most tightly integrated areas that reuse components are:

- FISAP "Self-Service" and the admin modules "Communication/Email" and "Reports"
- FISAP "Validation Edits" and the "Reports" module
- FISAP "Submit" process and the admin "FISAP Update" module
- Numerous admin modules reuse methods within FISAP page beans
- Utility beans contain methods that are used in 90% of the application

Database updates:

- Structure updates, stored procedures and triggers could impact any part of the admin site



10. Appendix C: Document Control

Version Number	Description	Release Date	Author
1.0	Initial Issue	May 10 th , 2002	Jason Patton

Table 21 - Document History



11. Appendix D: Acronym List

Acronym	Description
CB	Campus Based
CCB	Change Control Board
eCB	electronic Campus Based
FISAP	Fiscal Operations Report & Application to Participate
FMS	Financial Management System
FSA	Federal Student Aid
HTTP	Hypertext Transfer Protocol
IBM	International Business Machines
ID	Identification
IPT	Integrated Product Team
IRS	Internal Revenue Service
ITA	Integrated Technical Architecture
PART	Procedure Activity Report Tracking
PEPS	Postsecondary Education Participants System
PIN	Personal Identification Number
PLIST	Perkins Loan Institution Status Tracking
SIR	System Incident Report
TAR	Test Analysis Report
TCP	Transmission Control Protocol
TIVWAN	Title IV Wide Access Network
UAT	User Acceptance Test
UMASS	University of Massachusetts
VDC	Virtual Data Center

Table 22 - Acronym List